BOOK REVIEW

A new GIS working textbook, *Making Spatial Decisions Using ArcGIS Pro: A Workbook*, penned by Kathryn Keranen and Robert Kolvoord, explores the many applications of the soon-to-be-standard ArcGIS Pro software. Both authors have a wealth of GIS teaching experience as K–12 ESRI instructors, in class curriculum development, and in other relevant fieldwork backgrounds. Their workbook is the 4th in a textbook series published by ESRI Press, and it combines many of the same exercise types as previous versions, but with a primary focus on using ArcGIS Pro. This college-level and easily accessible workbook aims to provide users with a uniquely versatile perspective through scenario-based projects which follow step-by-step formatting. These projects incorporate a variety of scenarios that some GIS users have recently encountered in the United States. The scenarios presented in this workbook feature

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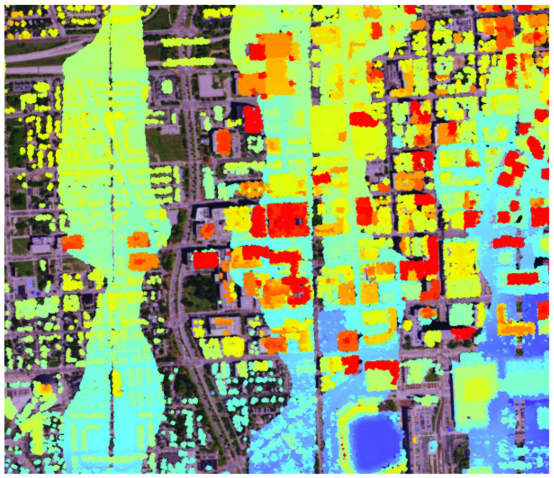
a little bit of everything from crisis management to LiDAR to imagery classification and processing as well as utilizing various data types. When purchased, this workbook comes with an *Advanced* license code, access to ESRI online resources, and data needed for completing the projects within the modules. Previous texts in this series include *Making Spatial Decisions Using GIS*, *Making Spatial Decisions Using GIS and Remote Sensing*, and *Making Spatial Decisions Using GIS and LiDAR*.

The target audience seems to be geared toward users with at least some ArcGIS Pro experience, and overall, could be an excellent transitional text for users who are more familiar with the older standards of ArcGIS for Desktop. It is recommended by the authors that users have at least a minimal working knowledge of GIS before perusing this ArcGIS Pro-centered edition.

The workbook offers two projects in each of its nine modules, and each of the projects have a suggested time commitment of two hours. For clarity, *modules* are equivalent to chapters and *projects* to exercises. The authors do a great job structuring each module in which all first projects give simple step-by-step instructions, whereas all second projects require user application of what was just learned in the previous project. Here, users could consider *project one* as the equivalent of using training wheels, and *project two* as having the training wheels removed. The module titles one through nine include: Hazardous emergency decisions, Hurricane damage decisions, Law enforcement decisions, Composite images, Unsupervised classification, Supervised classification, Basic lidar skills, Location of solar panels, and Forest vegetation height.



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Each module also has at least one brief introductory paragraph (some have more) for understanding the upcoming topic and what is coming next. The general workflow follows a set pattern seen earlier in their textbook series and is easy to track. The workflow delineation for each project is as follows: 1) Define the problem & scenario, 2) Identify project deliverables that support mapping decisions, 3) Document, set environments, and examine the data, 4) Perform analysis starting with the base map, and 5) Present and share work. Nested within these steps is the push for note taking, which the authors refer to as the process summary. The hope is to first have users revisit the newly learned steps later for reference, but to also allow for others to follow their instructions to replicate their work. However, after careful consideration, there are a few drawbacks.

The main critiques from what this reviewer perceived as "confusing" or "lacking" included navigating a non-intuitive interface, the lack of descriptive instructions for sharing data in ArcGIS Online, the author's approximated time commitments per exercise (2 hours suggested), and the lack of global representation within the data provided.

Issues with navigating the interface, especially with any new tool or software can be challenging and this workbook is no exception. On a positive note, the authors did attempt to address the interface navigating issue by suggesting more time for exploration in order to get more familiar with ArcGIS Pro's usability functions and the location of each tool type. Still, the workability and flow are quite different from ArcMap, so take as much time as you need to get familiar with ArcGIS Pro.

This aspect somewhat coincides with the aforementioned issue of the authors' suggested time commitment of two hours per exercise. It is not clear in the workbook if the authors intend this edition to work as more of a standalone self-teaching resource or if it is more designed for a formal classroom setting. If the latter is the intention, then the additional guidance in the form of visual aids from the instructor(s) would certainly help bring continuity.

A lack of global representation within the exercises was not a major hurdle to understanding the workflow or to learning the tools; however, equally representing "place" from various scales and aspects would set this text apart from previous versions. Essentially, inclusivity of anywhere other than the United States could be a selling point for users wanting foreign language translations. Perhaps other translations have additional regional examples?

The authors' instructions for integrating ArcGIS Online data were somewhat confusing at first glance and throughout the first few modules. Although, the nature of the iterative process did bring some clarity by the end of Module 4. Again, this would not likely be an issue if users worked through an introductory ArcGIS Pro textbook as suggested by the authors.

The preface and introduction are must-reads for all users because they cover some of the basic expectations and directionality of learning. A few examples of these expectations include functional design and layout, achieving an acceptable figure-to-ground relationship, and a brief rundown of Pro-specific applications.

A few more minor issues included a few confusing pages of composite images in the introduction of Module 4.1, the need for instructional images for exercises using the time slider function, and the need for adding a brief explanation for when and why to use what datum. Nevertheless, this working text does have some great aspects that should be mentioned as well.

Several positive aspects were discovered when working through the text. The first was how the authors ended each project with either presenting

or sharing an online map depending on the needs of the intended audience or project. This would be helpful for regular users in the field, as well as for layman types in communicating the results and findings. Module 2.1, which centered around damage from Hurricane Katrina, was outstanding at illustrating some of the realities regarding a rapidly changing climate and how to quickly address crises. The Carr Fire in Paradise, California comes to mind as an example of an even more recent scenario in which the authors' methods here could be applied for damage assessment.

Additionally, it is important to note that all modules within the text address relevant problems and/or real-world scenarios which can be applied to a multitude of disciplines. Interdisciplinary and applied work are seemingly where most research is headed, and this text illustrates some of these entities and levels. Certainly, not all disciplines are represented in the nine modules, but the systematic and processual frameworks introduced are more dynamic than not. The module pages are also color-coded for quick and easy access, and have an exceptionally high quantity of instructional images. This latest version also incorporates more images than previous editions which benefit those, like myself, who are more visual learners.

ArcGIS Pro's ribbon replaces the older toolbar seen in ArcGIS for Desktop and is mostly straightforward after reaching module 4. The authors also include a list of peer-reviewed sources at the beginning of each module which sets the user's mind at ease knowing that they are reliable. It also gives the user an opportunity to add to their proverbial toolboxes by seeking out other sources to see if they used the same methods or slightly different ones.

SUMMARY

Overall, *Making Spatial Decisions Using ArcGIS Pro: a Workbook* is an excellent text for college-level students who have had a formalized introduction to ArcGIS Pro. The authors expertly provide an expansive list of methods and applicable knowledge yet to be had from previous versions. Surely, the text is not perfect, but what it lacks can be remedied by knowledgeable instruction. Kathryn Keranen and Robert Kolvoord succeed in offering a new lens to view the bright future of ArcGIS Pro to those of us still reluctant to entirely switch.

ABOUT THE AUTHOR

Stanton Morse (B.S. in Geography, Texas State University - San Marcos 2010; B.A.'s in Anthropology and Political Science, Texas State University - San Marcos 2015) is a graduate candidate at Humboldt State University in Arcata, California. His thesis research focuses on lowland Maya settlement patterns, ecology, and geospatial analytics. Stanton is currently a Field Crew Chief at Archaeological Research and Supply Company in Humboldt County, California. He also has consulted with the Humboldt County Coroner's Office in human remains identification and crime scene recovery. Additionally, he recently completed his tenure as Graduate Research Assistant and Lab Manager for the Archaeology Research Lab and Collections at Humboldt State University.